WHAT IS CLAIMED IS:

1. A traffic engineering method of a network divided into a plurality of areas, each area including a plurality of nodes, said method comprising the step of carrying out a load-balancing process in said each area separately.

2. The traffic engineering method as claimed in claim 1, further comprising the step of deciding a destination of a packet in said each area.

3. The traffic engineering method as claimed in claim 1, further comprising the steps of:

calculating a normalized value used for the load-balancing process, based on address information of the packet supplied to an ingress node of the network from an outside of the network;

adding said normalized value to switching information of said packet; and

forwarding said packet from said ingress node to the plurality of nodes.

4. The traffic engineering method as claimed in claim 3, further comprising the steps of:

receiving said packet from said ingress node at an area boundary node located on a boundary of the plurality of areas; and

extracting said normalized value used for carrying out the load-balancing process in an area including said area boundary node, from the switching information of said packet.

5. The traffic engineering method as claimed in claim 1, further comprising the step of notifying a closest node apparatus that carries out the load-balancing process and is the closest to said node apparatus on an upstream side of said node apparatus, about a failure if detecting the failure.

6. The traffic engineering method as claimed in claim 4, further comprising the step of redistributing a traffic flow from a failed route to a route other than the failed route if receiving a failure notification at said ingress node or said area boundary node.

7. The traffic engineering method as claimed in claim 6, further comprising the step of deciding whether a traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route if receiving the failure notification at said ingress

node or said area boundary node.

8. The traffic engineering method as claimed in claim 7, further comprising the steps of:

setting a new route, if said failure-notification receiving unit decides that the traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route; and

switching the traffic flow from said failed route to the new route.

9. A node apparatus included in a network that is divided into a plurality of areas, each area including a plurality of nodes, in which an entire network resource is optimized by traffic engineering, said node apparatus comprising an inside-area destination deciding unit that decides a destination of a packet in said each area, said destination being used for carrying out a load-balancing process within said each area.

10. The node apparatus as claimed in claim 9, wherein said node apparatus corresponding to an ingress node supplied with the packet from an outside of the network includes a normalized-value calculating unit that calculates a normalized value used for the load-balancing process based on address

information of said packet, and a switching-information creating unit that adds said normalized value to switching information of said packet.

11. The node apparatus as claimed in claim 9, wherein said node apparatus corresponding to an area boundary node located on a boundary of the plurality of areas includes a normalized-value extracting unit, which extracts a normalized value used for carrying out the load-balancing process in an area including said node apparatus, from switching information of the packet supplied from an adjacent area.

12. The node apparatus as claimed in claim 9, further comprising a failure notifying unit that notifies a closest node apparatus that carries out the load-balancing process and is the closest to said node apparatus on an upstream side of said node apparatus, about a failure if detecting said failure.

13. The node apparatus as claimed in claim 10, further comprising a traffic distributing unit that redistributes a traffic flow from a failed route to a route other than the failed route if receiving a failure notification.

14. The node apparatus as claimed in claim 13, further comprising a failure-notification receiving unit that decides whether a traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route if receiving the failure notification.

15. The node apparatus as claimed in claim 14, wherein said traffic distributing unit switches the traffic flow from said failed route to a newly set route, if said failure-notification receiving unit decides that the traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route.

16. The node apparatus as claimed in claim 11, further comprising a traffic distributing unit that redistributes a traffic flow from a failed route to a route other than the failed route if receiving a failure notification.

17. The node apparatus as claimed in claim 16, further comprising a failure-notification receiving unit that decides whether a traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route if receiving the failure notification.

18. The node apparatus as claimed in claim 17, wherein said traffic distributing unit switches the traffic flow from said failed route to a newly set route, if said failure-notification receiving unit decides that the traffic loss occurs by redistributing the traffic flow from said failed route to the route other than said failed route.

19. A network system, comprising a plurality of areas, each area including a plurality of nodes,

wherein an entire network resource is optimized by traffic engineering, and a load-balancing process is carried out in said each area separately.